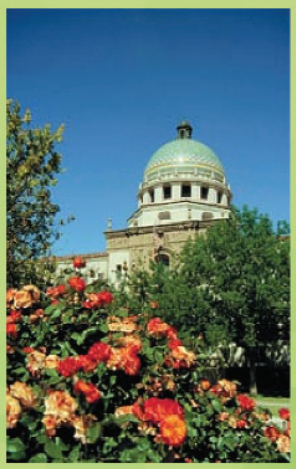
The Office of Conservation and Sustainable Development

Sustainability Report 2006-2007

- Green Building
- Energy
- Transportation
- Water
- Waste Reduction
- Urban Design
- Urban Nature



Office of Conservation and Sustainable Development 345 E. Toole Ave. 2nd Floor 520-791-4675

City of Tucson

2006 - 2007 Sustainability Report

CITY COUNCIL

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LESLIE LIBERTI
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Leslie Liberti Director

This April 22, the 37th annual Earth Day event, was a time to reflect on the status of our local and global environments and the role we are playing as individuals in protecting the future of our homes, our community, our planet. Reports on the environment are bringing alarming news — an increase in numbers and severity of storms, threats to water supplies caused by declining snow packs and extended drought, and dramatic declines in species ranging from polar bears to honey bees all point to the beginnings of a major breakdown in our global systems. In February, the scientific community declared in a report from the International Panel on Climate Change (IPCC) that "warming of the climate system is unequivocal."

Closer to home, while the greater Tucson region has relatively good air quality, a strong focus on water conservation, and increasing use of alternative fuel vehicles, regional vehicle miles traveled now exceed 22 million miles per day on average, which equates to daily consumption of around 1 million gallons of petroleum, and nearly 60 percent of commuters drive alone to work. Community recycling rates result in the diversion of only about 14 percent of waste from the landfill, just a small fraction of local energy is produced from renewable sources, and underlying these and other environmental issues is a regional population growth rate that is one of the highest in the nation.

We are all part of the problem, now we all must be part of the solution.
The warnings in the IPCC report underscore that change is needed and the outlook that has been forecasted requires that both governments and individuals stop delaying and act. The City of Tucson has stepped up to the challenge and stands out as a national leader in promoting sustainability. In March of this year, the Earth Day Network released environmental rankings for the 75 largest cities in the country. Tucson not only came out in the top 30% among all cities surveyed, but ranked 4th among those cities with a population between 500,000 and 1 million.

What makes Tucson such a leader?
There is a global movement toward "sustainable development" and Tucson has assumed a leadership role in promoting economically, environmentally, and socially sustainable urban living. This 2006-2007 Sustainability Report highlights many of the efforts the City of Tucson has made to promote sustainability. Smart growth, integrated transportation and land use planning, safe vibrant neighborhoods, city core renewal, water conservation, green building, waste reduction, pollution prevention, and protection of important habitats and ecosystem functions — all issues typically associated with urban sustainability — are part of day-to-day management at the City of Tucson.

What does the future promise?
In June 2006, the City made a commitment to ensure that sustainability remains a key focus in its programs and operations through the creation of the Office of Conservation and Sustainable Development (OCSD). The creation of OCSD makes Tucson one of just a few cities in the nation with an office dedicated to promoting sustainability. The mission of OCSD is to 1) promote continued City leadership by helping Departments find more ways to implement sustainability principles in their activities; 2) help the City and the community develop a clear vision that recognizes the importance of both global issues, such as climate change, and a high quality of life for all residents; 3) support the efforts of residents and businesses to become more sustainable in their own activities; and 4) through outreach and education, help the entire community understand that the future of our city — the health, security, and quality of our lives now and in the future — is in our collective hands.

Leslie F. Liberti
Director,
Office of Conservation and Sustainable Development

US Mayors' Climate Protection Agreement

The Kyoto Protocol is an international agreement to address climate disruption: expected to occur as a result of human-caused green house gas emmissions into the atmosphere. The agreement sets a goal of reducing global warming pollution levels to 7 percent below 1990 levels by 2012. The Kyoto Protocol went into effect on February 15, 2005 in the 141 countries that had ratified the agreement. In response to the United States government's failure to sign on to the Kyoto Protocol, mayors from around the nation signed the U.S. Mayors' Climate Protection Agreement urging the federal and state governments to enact policies and programs to meet or beat the Kyoto reduction target. The Mayor's Climate Protection Agreement also urges the U.S. Congress to pass bipartisan greenhouse gas reduction legislation that includes a flexible market-based system of tradable credits among emitting industries. On September 6, 2006 the Tucson Mayor and Council adopted the Mayors' Climate protection Agreement, becoming one of more than 400 cities that have signed on to date. Besides Tucson, only two other cities in Arizona have endorsed the agreement – Buckeye and Flagstaff.

The signatory cities agree to take action in their own operations and communities toward meeting or exceeding Kyoto Protocol targets for reducing global warming pollution, including efforts to:

- Inventory global warming emissions, set reduction targets and create an action plan.
- Reduce sprawl, preserve open space, and create compact, walkable urban communities.
- Promote transportation options to single-occupant car use.
- Increase the use of clean, alternative energy.
- Improve municipal energy efficiency.
- Purchase only Energy Star equipment and appliances for City use.
- Practice and promote sustainable building practices, such as through the LEED program.
- Reduce fossil fuel consumption by the municipal fleet.
- Increase pump efficiency in water systems.
- Increase recycling rates.
- Maintain urban green space and promote tree planting to increase shading and to absorb CO_2.
- Educate others about reducing global warming pollution.

In February 2007, Earth Day Network released a new comprehensive environmental report card that ranks 72 U.S. cities according to more than 200 environmental, health and quality of life indicators. The new report evaluates indicators in seven environmental and health categories: Toxics and Waste; Air Quality; Drinking and Surface Water; Quality of Life; Parks and Recreation Opportunities; Human and Public Health; and Global Warming and Climate Change.

According to the Earth Day Network President, "this study is the first of its kind, not only because of the sheer quantity of environmental data analyzed, but also because it refines 'environment' to include public health, poverty, education, and other quality of life issues."

How did Tucson score?

- Tucson's overall score was 3.35 (1 is best, 10 is worst)
- Tucson ranked 21st overall
- Tucson ranked 4th among the cities with a population between 500,000 and 1,000,000.

The complete Urban Environment Report with methodology, interactive maps and city-by-city data can be viewed at http://www.earthday.net/UER/report.

Urban Environmental Accords

The United Nations Urban Environmental Accords (Accords) were signed by 50 cities worldwide on World Environment Day 2005 in San Francisco. By implementing the Urban Environmental Accords, signatory cities aim to realize the right to a clean, healthy, and safe environment for all members of society. The City of Tucson endorsed the Accords on November 15, 2005.

The 21 actions that comprise the Accords are proven first steps toward environmental sustainability. To achieve long-term sustainability, cities will have to progressively improve performance in all thematic areas. The call to action set forth in the Accords will often result in cost savings as a result of diminished resource consumption, as well as improvements in the health and general well-being of city residents.

The 21 Accords include actions to:

1. Increase the use of renewable energy to meet 10% of the city's peak electric load by 2012.
2. Reduce the city's peak electric load by 10% by 2012.
3. Create a citywide greenhouse gas reduction plan that outlines steps to reduce emissions by 25% by 2030.
4. Achieve zero waste to landfills and incinerators by 2040.
5. Reduce the use of disposable, toxic, or non-renewable products by at least 50% by 2012.
6. Implement "user-friendly" recycling and composting programs to reduce per capita solid waste disposal by 20% by 2012.
7. Mandate a green building rating system standard that applies to all new municipal buildings.
8. Promote higher density, mixed use, walkable, bikeable and disabled-accessible neighborhoods.
9. Create environmentally beneficial jobs in slums and/or low-income neighborhoods.
10. Provide accessible public park or recreational open space withina half-kilometer of every city resident by 2015.
11. Inventory existing canopy coverage in the city and maintain canopy coverage in at least 50% of all available sidewalk planting sites.
12. Protect critical habitat corridors and other key habitat characteristics from unsustainable development.
13. Expand affordable public transportation coverage to within one-half kilometer of all city residents by 2015.
14. Reduce particulate matter and smog-forming emissions from the city fleet by 50% by 2012.
15. Reduce the percentage of commute trips by single-occupancy vehicles by 10% by 2012.
16. Reduce or eliminate the use, by municipal government, of one product, chemical, or compound that represents a risk to human health.
17. Promote locally grown organic foods and ensure that 20% of all city facilities serve locally grown and organic food by 2012.
18. Reduce the number of days categorized as having "unhealthy" or "hazardous" air quality by 10% by 2012.
19. Reduce water consumption by 10% by 2015.
20. Protect the ecological integrity of the city's primary drinking water sources.
21. Expand the use of recycled water.

Green Building

In 1998, the City adopted the ***Sustainable Energy Standard*** (SES) for all new City buildings. The SES consisted of a modification to the International Energy Conservation Code (IECC) and requires that building energy efficiency be improved by at least 50 percent over the IECC guidelines. On April 18, 2006 the Mayor and Council adopted a resolution directing that City buildings and renovations of greater than 5,000 square feet should comply with the requirements of the ***Leadership in Energy and Environmental Design*** *(LEED)* rating system at the Silver or higher level. By applying the LEED standard, the City has expanded green building requirements for City buildings to include not just energy efficiency, water conservation, and waste reduction, but also consideration of sustainable site design, indoor air quality, and use of recycled and sustainable materials.

LEED Rating System:

- Platinum
- Gold
- Silver
- Certified

In 2005 and 2006, the following building projects were constructed in accordance with the SES:

- The 11,085 square foot Fire Station 20.
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- The 24,600 square foot Clements Activity Center, which features a 4 kilowatt solar system
- The 9,200 square foot El Pueblo Senior Center.
- The 17,000 square foot Northwest Mansfield Recreation Center Expansion.

The following projects were designed to meet the SES and are currently under construction:

- The 20,000 square foot Pima Building at 149 N. Stone.
- The renovation of the 69,000 square foot Westside Police Station.
- The renovation of the 70,000 square foot Police Evidence Building.

The following projects are under design or construction at the LEED Silver level or higher:

- The 15,000 square foot Fire Station #22 and Battalion Chief Headquarters, scheduled for completion in July 2007, will feature a solar water heating system and energy efficient air conditioning systems.
- The 67,000 square foot Fire Central building, which will co-locate three critical Fire Department functions: Administration, Fire Prevention and Fire Station #1.
- The 25,000 square foot Tucson Water Department Eastside Satellite Facility, which in addition to being designed to LEED Silver standards, will provide work space for approximately 55 field staff whose primary work areas are on Tucson's east side. This will significantly reduce drive time and fuel consumption currently used to commute from Water's west side operational center.

The Green Garage

The ***Pennington Street Garage*** was built using innovative, sustainable technology to minimize impact on Tucson's sensitive desert environment. The garage is an exemplary project for its use of innovative technology and 'green' building principles. As the largest municipally-owned solar-powered facility in the State of Arizona, the Pennington Street Garage has become a model for green building – particularly green building in the public sector. The garage is a mixed-use facility with approximately 750 covered parking spaces and 12,000 square feet of ground floor office and restaurant space.

So Green, it is Platinum...

The Reid Park Zoo has just broken ground on the Conservation Learning Center, which has been designed to achieve a LEED Platinum rating. Project features include solar power panels to produce energy for the building, highly efficient heating and cooling systems, recycled and sustainable construction materials, and water harvesting. Completion is scheduled for December 2007. The building will be 10,000 square feet and will demonstrate the best in sustainable construction techniques to Zoo guests.

Looking Ahead...

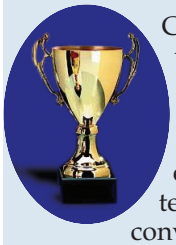
There is a growing recognition of the need for and benefit of more sustainable building design. In late 2006, local architects, builders, developers, government officials, and other interested parties formed a Southern Arizona branch of the U.S. Green Building Council. In addition, local developers and builders are voluntarily creating "green" projects – acknowledging not only the growing market demand for green buildings, but also the responsibility we all share to be stewards of our environment. In order to support the efforts of these developers, and others who are interested in green building, the City is planning to initiate a green building program in 2007.

Energy

The City is working to improve the energy efficiency of City buildings and operations, increase the City's use of solar energy, and promote energy conservation. The city is also utilizing the input of energy sector experts to identify additional opportunities to reducing community-wide energy use.

Improvements in Energy Efficiency

The City participates in the ***Energy Star Program***, sponsored by the U.S. Environmental Protection Agency. This program, which began as the "Green Lights Program," encourages energy improvements through lighting, mechanical, and control retrofits. During 2005 and 2006, energy efficiency improvements at city facilities such as the Main Library, Thomas O. Price Service Center, Ward 3, Woods and Valencia Libraries, and Clements Fitness Center, resulted in approximately $60,000 per year in energy savings. The City is presently investing over $400,000 annually in energy efficiency upgrades.



City traffic signal indication units have been converted from incandescent lamps to higher-efficiency light emitting diode (LED) technology. This conversion is resulting in an estimated electricity saving of $420,000 annually. For this program, the City of Tucson received the ***Governor's Award for Energy Efficiency*** in 2004.

The City has been a partner in the ***Cool Communities Program*** for a number of years. Cool Communities projects include the use of light color roofing material, light colored paving, and strategic tree planting to reduce the amount of energy needed to cool buildings. Through a 2001 demonstration project at the Thomas O. Price Service Center, the City determined that it is cost effective to install highly reflective white roof coatings over air-conditioned spaces. Since 2001, energy savings at Thomas O. Price Service Center directly resulting from the installation of the reflective roof has been approximately $24,000.

Light color roofs are now in the City design and construction standards. As another part of the Cool Communities Program, the City assists Tucson Clean and Beautiful in the Trees for Tucson Program.

Solar Power

Since 1999, the City has built up an impressive inventory of solar energy utilization systems. Funding for the solar energy system installations comes from the innovative ***1% for Solar Program***. As the basis for this program, the avoided electricity costs from the July 1999 Tucson Electric Power 1% rate reduction were directed to be used for the installation of solar energy systems in city facilities. Under this program, the City has installed 7 solar energy systems 5 solar water heating systems, solar-powered remote data acquisition systems, and solar-powered emergency fire signals and flood warning signals.

Over two hundred state-of-the-art solar illuminated advertising bus shelters have been installed in the City of Tucson.

Through the Industrial Development Authority (IDA), the City has received authorization to issue, in 2007, approximately $7.7 million in ***Clean Renewable Energy Bonds*** (CREBS) to fund the installation of photovoltaic (PV) systems on City buildings. These bonds will fund seven City projects totaling 1.2 megawatts (MW) of generating capacity.

City staff are exploring the feasibility of a 5 MW distributed generation solar project at the Central Avra Valley Storage and Recovery Project (CAVSARP).

Teaching Energy Conservation

The City recently completed work under a four-year grant to teach energy conservation design and construction practices in Tucson's residential and commercial building sectors. City staff received assistance from the Arizona Energy Office to implement this grant from the U. S. Department of Energy.

Expert Input

Facilities Management staff provide support for the jointly appointed and funded ***Tucson-Pima County Metropolitan Energy Commission*** (MEC). The MEC's mission is "serving as a catalyst for the City of Tucson and Pima County to build a more sustainable energy future in the region." MEC was instrumental in developing the City's Sustainable Energy Standard (SES) and the Greater Tucson Strategic Energy Plan. The Greater Tucson Strategic Energy Plan, while still under development, promotes the use of safe, secure, reliable, efficient, sustainable and clean energy resources.

The City of Tucson has created the ***Davis-Monthan Air Force Base Alternaive Energy Solutions Task Force*** to identify a secure independent alternate energy source for Davis Monthan AFB. The primary driver for this concept is to enable DMAFB to generate their own energy to reinforce Homeland Security measures on military bases.

Methane gas generated from the Los Reales Landfill is pumped to Tucson Electric Power's (TEP) Irvington plant and burned to generate 6,000 kilowatts of electricity per year, enough energy to power 5,500 Arizona homes annually. This project allows TEP to replace approximately 20,000 tons of coal per year with an associated reduction in emissions of 21,103 tons of CO_2 and 127 tons of SO_2 annually. The City is planning methane-to-energy projects at Vincent Mullins and Harrison landfills as well.

Transportation

The city has invested in planning for and implementation of transportation improvements that promote a livable community. These improvements more environmentally sensitive in design and offer greater alternative transportation options. The City has also committed to reducing fossil fuel consumption by increasing the use of alternative fuels in the City fleet and buses and by educating the community about the need for and availability of alternative transportation options.

Transportation Improvements

The ***Stone Avenue Corridor Project*** addressed the different elements that contribute to making a corridor more livable, such as streetscape beautification, economic development, urban design, historic preservation and public art. This $2.4 million enhancement project, which began in January 2006, consisted of new curbs and sidewalks along Stone Avenue between First and Sixth streets, a reduction in side street widths, reconfigured parking, replacement of the existing continuous center turn lane with landscaped islands and textured pavement treatments, new landscaping, and improvements to the existing irrigation system and street lighting.

The ***Oracle Corridor Project*** focuses on encouraging reinvestment and redevelopment in an older, high crime area of the city. Visioning workshops with neighbors, business, community groups, and developers have revealed an interest in "new urbanism" principles such as green building development, mixed uses, better pedestrian and transit access to downtown and the community college campus, and use of water harvesting methods in conjunction with landscaping.

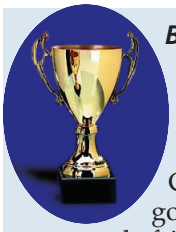
The Campbell Road Enhancement Project will similarly improve the "Main Street" portion of Campbell through better mixed-use development and pedestrian-oriented enhancements.

The City's ***Neighborhood Traffic Management*** program improves the quality of neighborhoods by using street trees and landscaping as part of the traffic control system.

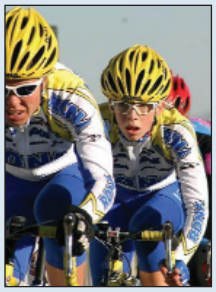
On May 16, 2006, Pima County voters approved a half-cent sales tax to fund transportation improvements. Over the next 20 years, the ***Regional Transportation Authority*** (RTA) Plan will dedicate nearly $533 million for transit enhancements, including expanded hours of service, new service areas, greater weekday frequencies, more express service, and a fleet expansion to 280 buses. Sun Tran implemented the first RTA-funded fixed-route improvements in fall 2006, when additional buses deployed on key routes helped to relieve a portion of the overcrowding. In 2007, later weeknight service on 21 routes and expanded weekend service hours along 15 routes are planned for implementation. In addition to fixed route improvements, the RTA funds expansion of Van Tran, the city's paratransit system; increased neighborhood circulators; and development of a modern streetcar route to enhance mobility between the downtown and university areas.

The RTA Plan also includes $45 million for Wildlife Linkages that will help alleviate the potential for new roads to act as barriers to wildlife and reduce the impact of existing roads on wildlife.

In 2005, Sun Tran's maintenance facility became the first in the U.S. certified as compliant with the requirements of ***ISO 14001***, the international standard for an Environmental Management System (EMS). The EMS developed by Sun Tran contains operational procedures that assure compliance with federal, state, and local environmental regulations, as well as facilitate environmental stewardship. Sun Trans EMS identifies four significant aspects of environmental management: storm water, wastewater, hazardous waste, and coolant. Van Tran is currently implementing its own EMS, with goals established to improve energy conservation and materials recycling. The Van Tran EMS is anticipated to become ISO 14001 certified this year.



Bicycle Friendly Community - Gold Level rating. In 2006, the entire Tucson/Eastern Pima County region received a gold level rating as a bicycle friendly community from the league of American bicyclists. The gold level rating can only be "topped" by a platinum rating. The platinum level rating is coveted, and serves as a strong impetus for Tucson to continue to improve bicycling-related services.

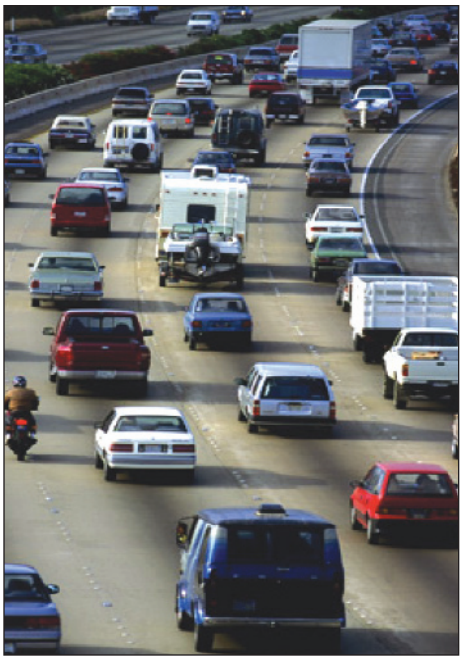


Transportation Planning

The City's Transportation and Urban Planning and Design Departments have been working to create standards for major streets and routes that utilize ***Context Sensitive Design Solutions*** for urban thoroughfares. These standards will promote walkable communities, where the "green" and "grey" infrastructure is integrated to provide movement and access choices to the community.

The City of Tucson ***Major Transit Investment Study*** is identifying potential transit solutions to connect major activity centers in the central core. A modern streetcar was recommended as the locally preferred alternative and received unanimous approval from the City of Tucson Mayor and Council in January 2006. The project is currently in the environmental assessment phase of the study, which is scheduled for completion in Summer 2007.

Transportation



In November 2006, the Department of Urban Planning and Design completed the 2007-2011 ***Short Range Transit Report*** (SRTR). The SRTR summarizes current transit service conditions, provides a brief overview of planned improvements scheduled for the next five years, serves as an interim basis for the planning of transit services, and provides detailed data for future planning efforts. The SRTR will help coordinate local transportation and use planning efforts throughout the Tucson Region.

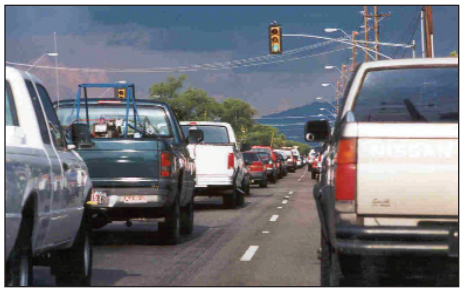
Alternative Fuels

Currently, 90 percent of Sun Tran's fleet is powered by ***clean-burning fuel*** technologies. In fall 2005, Sun Tran added 38 new replacement buses to its fleet. The 40-foot low-floor coaches are fueled with biodiesel which, like compressed natural gas, emits significantly fewer particulates than traditional diesel-fueled vehicles. Another 136 buses are either dedicated compressed natural gas (CNG) or dual-fueled buses. Sun Tran will take delivery of 12 additional biodiesel replacement buses in early 2007.

Ninety-seven percent of Van Tran's active fleet runs on clean-burning fuels. Of the 119 vehicles, 115 vans operate on biodiesel.

Fleet Services Division implemented the use of ***B-20 biodiesel*** in October 2006 after a very successful four-month pilot program that began in July of 2005. To date, the City has used 220,764 gallons of B-20 in its fleet of 400 diesel powered vehicles and equipment. Since switching to biodiesel, the City has reduced foreign oil consumption by approximately 44,000 gallons, reduced diesel vehicle emissions, and realized a cost savings of approximately $34,000 in fuel costs. In the first six months.

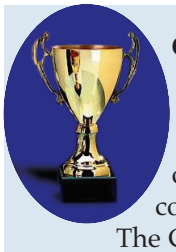
The City has also entered into an agreement with the University of Arizona for the purchase of E-85 ethanol for use in the city's 79 flex fuel (gasoline and E-85 ethanol) fleet vehicles. As the fleet of ***flex fuel vehicles*** increases, Fleet Services plans to modify existing gasoline pumps to dispense E-85. E-85 ethanol is a "home grown" renewable energy source made primarily from corn, which reduces our dependence on foreign oil, reduces vehicular emissions, improves vehicle performance, and still costs about the same as regular gasoline.



Education and Outreach

An annual ***Bike to Work Day***, coordinated with major employers throughout region, promotes the use of alternate modes of transportation to support clean air, reduce traffic congestion, and encourage healthy lifestyles. At this public event, City staff provide training, outreach materials, and information to encourage bike commuting by employees. The event, held in downtown Tucson, also offers safety devices, demonstrations, class sign ups, and a free continental breakfast.

An ***Annual Clean Air Days*** event provides activities related to and information on topics such as car pooling, reducing pollution activities, using the bus to get to work, clean fuels, and bicycle commuting.



City of Tucson EPA award for Best Workplaces for Commuters

Best Workplace for Commuters is a voluntary business-government program that distinguishes and provides national recognition to employee's offering outstanding commuter benefits.

The City of Tucson provides the following services to encourage alternate modes of transportation: low cost bus passes, carpool matching, Rideshare, Telework (by special permission only), Vanpool, and participation in the annual Travel Reduction Survey.

Water

The City's commitment to smart water management involves comprehensive planning to meet the long-term water supply needs of the community, coupled with a strong water conservation program. The City's water conservation efforts include actions to reduce City water use and targeted water conservation education for both the general public and for landscaping and nursery professionals. The protection of local water supplies also requires effective management of stormwater quantity and quality.

Planning Long-term

Tucson Water has initiated a dialogue with the community regarding the water resource challenges which must be addressed in the coming years. This dialogue is centered around the goals of the ***Water Plan 2000-2050***, which are to meet future demand for water resources in a manner that is environmentally sound and cost effective, meet State regulatory requirements, and provide water that is acceptable and affordable.

By expanding the use of Colorado River water, the City can reduce the over-drafting of finite groundwater resources. The City currently recharges Colorado River water at the Clearwater facility, also known as the Central Avra Valley Storage and Recovery Project (CAVSARP). In 2006, recharge capacity at the Clearwater facility was increased by 33 percent, from 60,000 acre-feet per year to 80,000 acre-feet per year. In 2007, construction of ***Clearwater Phase 2***, also known as the Southern Avra Valley Storage and Recovery Project (SAVSARP) begins. Up to 45,000 acre-feet per year of recharge will be possible at that facility by 2008.

In November 2006, Mayor and Council approved a ***Drought Preparedness and Response Plan*** that establishes indicators for potentail drought impacts on city water supplies that would trigger special drought response measures.

Water Conservation

A ***Community Conservation Task Force*** (CCTF) was empanelled in 2005. Stakeholders representing a wide variety of residential, business, education, environmental and other interests worked together on developing a list of conservation strategies that have the potential to permanently reduce water use per capita. The CCTF recommendations will go to Mayor and Council in Spring 2007.

The Reid Park Zoo uses lots of water to keep animal exhibits and night houses clean, and to keep the vegetation lush. Highly treated wastewater, or "reclaimed" water, is used for many of the cleaning and irrigating needs.

TDOT's improvements for Harrison Road, Speedway Boulevard to Old Spanish Trail, currently under construction, includes extensive use of ***rainwater harvesting*** to reduce the use of irrigation water for landscaping.

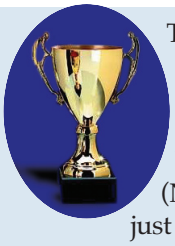
Virtually all of the City''s roadside and median landscaping utilizes ***reclaimed water*** for irrigation.

A ***Water Loss Control Program*** began in 2006 with the goal of reducing unaccounted for water. This designation generally includes water lost through system leaks, community fire protection water, water which flows through a customer meter but is under registered water lost through main breaks or used to flush mains, or other water which is pumped from the ground but does not generate revenue.

In response to the Drought Preparedness and Response Plan, the City will initiate a comprehensive ***water audit*** program in 2007. This program will examine all city water use and idenitify water-saving and water efficiency measures for all city facilities, landscapes, and equipment.

Stormwater Management

The City adopted the ***Stormwater Quality Ordinance*** in October 2005. The Ordinance provides authority to inspect industrial facilities and construction sites to evaluate their compliance with federal and state stormwater quality requirements.



TDOT administers the City of Tucson Stormwater National Pollution Discharge Elimination System (NPDES) program, which just received an **"*outstanding*"** rating from the EPA.

Outreach and Education

The ***Water Harvesting Guidance Manual*** was adopted in October of 2005. Implementation of water harvesting techniques is a water conservation measure that can also enhance natural habitats. This manual provides information and design ideas to developers, engineers, designers, contractors and the general public.

For decades, Tucson Water has worked with customers to promote water conservation through a variety of innovative programs. As a result, Tucson is recognized throughout the world as a leader in water efficiency with one of the lowest per person water usage rates in the western United States.

Some of Tucson Water's most popular and effective conservation programs are:

WaterSmart Workshops

These workshops are geared toward homeowners. Topics include Drip Irrigation Design and Maintenance, Plant Selection, Irrigation Timer Use, and Rainwater Harvesting.

Beat the Peak

For more than 25 years, Pete the Beak, the utility's duck mascot, has reminded generations of Tucsonans to Turn off the Tap, Group their Greens, Fix their Faucets, and Beat the summertime Peak.

Water

Conservation Speakers Bureau
Our conservation experts regularly speak to business and service groups, homeowners associations, youth groups and others about the need to reduce our use of water and become a water efficient community.

SmartScape Workshops
This series offers landscape professionals and property managers a high-quality training course and prepares them to be certified as a specialist in water efficient landscape practices.

'Da Drops
Designed to teach 3rd-grade students about the water cycle, groundwater, and water distribution. Students view a video, conduct water saving activities, and interact with "Dr. Faucet" during an interactive classroom presentation.

Our Water, Our Future
Activities are designed for 5th-graders, this five-unit classroom curriculum and in-class presentation designed for 5th graders, teaches students about the water cycle, water supply, and water quality.

Tucson Toolkit
7th and 8th grade students work through a five-unit curriculum designed to teach about the water cycle, water quality, and water conservation. An optional home-audit classroom research project is available.

High School Program
Designed to bring water studies outside the 'science class' environment.

Teacher Internships
Twenty-five motivated High School teachers are offered a two-week paid internship at Tucson Water. In turn, they develop lesson plans that use what they've learned about water.

Wetlands Program
Tours of Tucson Water's constructed wetlands and classroom presentations give students a hands-on experience of wastewater treatment, recharge, and conservation.

Sweetwater Wetlands Guidebook
A combination nature field guide and activity booklet, this innovative addition to Tucson Water's student outreach made its debut in 2006.

Zanjero Program
Tucson Water customers can make an appointment for a free Water Audit designed to maximize water conservation potential around the home.

Waste Reduction

Waste reduction requires a multi-pronged approach involving a reduction in the amount of waste that is generated and sent for landfilling, the use of recycled materials in city operations, and education and outreach efforts increase community recycling rates in City operations.

The City has initiated a pilot ***green waste composting*** project. This pilot has demonstrated that a fertilizer can be produced by combining herbivore waste from the Zoo with green waste; both creating a marketable product and extending the life of the landfill. The initial outcomes of the pilot have been promising enough that the project is being expanded. Environmental Services receives approximately 5,500 tons of green waste per year based on volumes measured through January 2005. In addition to being used in the green waste composting program, this material is chipped to produce mulch which is used for erosion control on the landfill sideslopes.

The Procurement Department is responsible for disposal of ***scrap metal*** generated by the City. The types of scrap metal sold for recycling include mixed steel, copper, aluminum (including printing plates and film from Procurement's Reprographics Division), brass, and cast iron. This process not only provides revenue to the City, but also results in a positive environmental impact. The metals are recycled into raw material that is used for other products. Environmental Services also diverts scrap metal that has been received at the landfill. They have diverted and recycled approximately 9 million pounds of scrap metal to date, with more than 1,500 tons recycled in Fiscal Year 2006.

Environmental Services has joined with Pima County to provide a ***Household Hazardous Waste*** program where both residents and small businesses can bring hazardous items for recycling, exchange, or safe disposal. The program provides for one main site and three outreach sites. In addition, Los Reales Landfill has established a location for residents to bring in antifreeze, batteries, oils and paints. This site was opened in March 1998, and it has seen steady increases in collection rates. In Fiscal Year 2005/2006, approximately 700 tons of waste was collected through these programs, 98% of which was reused or recycled. This included more than 180,000 pounds of batteries, about 234,000 pounds of latex paint, and over 507,000 pounds of used oil.

Use of Recycled Materials
The benches used in both bus shelters and for the street furniture program in Tucson are made substantially from ***recycled plastic and sustainable wood products***. The legs and slats in these benches are made exclusively from 100% recycled plastic parts manufactured by Plastic Recycling of Iowa (PRI). PRI currently processes over four million pounds of plastic that

Waste Reduction Continued

would otherwise be diverted to landfills. There are approximately 7 milk jugs and 4 two-liter soda bottles to a pound of finished product. Each bus bench contains approximately the equivalent of 1500 milk jugs and 850 two-liter soda bottles.

The Tucson City Code requires that recycled materials, as long as they conform to specifications, will be purchased if the price is within 10% of a low bid non-recycled material. The Code also allows for the purchase of ***recycled material,*** even if it is more than 10% of the low bid non-recycled option, as long as substantial budget impacts will not result.

The City currently utilizes a wide range of products made from recycled materials. The City only stocks envelopes made from recycled material. All City letterhead, stationery, and business cards are printed on recycled paper; the City also uses recycled copy paper. The recycled paper that is purchased has a minimum of 30% recycled product. By using recycled copy paper alone, the City saves an estimated 260 trees per month.

The City also uses recycled paper toilet tissues, napkins, and hand towels exclusively. All polyethylene containers purchased by the City must include at least 10 persent post-consumer recycled plastic. The City has also implemented the Environmental Protection Agency's guidelines for all trashcan liners, which requires a minimum of ten percent of post-consumer material. As part of another creative program, the Tucson Police Department uses remanufactured as well as new ammunition. Remanufactured ammunition is produced using expended brass from spent ammunition. Annually, the Police Department uses more than 1 million rounds of remanufactured ammunition.

Education and Outreach

Since 1994, the City has sold over 9,800 ***compost bins*** to the public through annual truckload sales events. Home composting results in the diversion of an average of 1,500 pounds of waste per household per year from the landfill.

The City of Tucson offers a range of recycling outreach and education programs, which include the following:

Tucson Clean & Beautiful offers "***E Pluribus Re-THINKs-It!***," an entertaining and educational play for children in kindergarten through 3rd grade. Teachers may contact Tucson Clean & Beautiful to schedule a performance.

The City offers information to apartment managers who would like to educate their residents about the ***Neighborhood Recycling Centers*** available for their use in Tucson. Environmental Services staff is also available to present recycling information to tenant groups or to work directly with apartment managers to evaluate their recycling options.

¡VIVA RECICLAJE! provides enhanced services in waste reduction and recycling education to Tucson's Hispanic population. To motivate community participation, Environmental Services offers bilingual recycling education resources to neighborhood associations, schools, club, and any other organization. Bilingual staff and volunteers can make presentations about waste reduction and recycling, help teachers assemble displays, train bilingual (Spanish) participants to be Master Recyclers, coordinate field trips to Los Reales Landfill and local recycling centers, and provide displays or information booths at a variety events.

Master Recyclers are specially-trained volunteers who give presentations about recycling to civic, neighborhood and other community groups, and who help staff at outreach events. A Master Recycler is a trained expert on recycling in Tucson and is a valuable asset to Tucson and the planet.

Urban Design

The City has many policies and programs in place or under development that advance compact, mixed use, walkable, bikeable and accessible neighborhoods. The efforts focus on both the advancement of smart growth principles in large-scale planning for undeveloped lands along the fringe of the City and also the improvement of existing neighborhoods and other urban areas within the core of the City.

Planning for Future Development

In 2005, Mayor and Council adopted the ***Houghton Area Master Plan*** (HAMP). The HAMP is an area plan for 10,800 acres of mostly undeveloped land on the southeast side of the city. The HAMP policies call for master planning of the land and include provisions for the preservation of washes based on the identification of ecological envelopes. This protects not only the riparian vegetation in the channel but also associated overbank vegetation.

City staff are working with the Arizona State Land Department to help identify basic land use patterns, master planning areas, priority conservation areas, and transportation corridors in the Southlands vicinity.

Urban Design

The ***Planned Community District*** (PCD) zone is designed to facilitate the public review and approval process for master planned community developments. Adoption of the new zone will require amendments to the City Land Use Code and to City Development Standards, review by the Planning Commission, and approval by the Mayor and Council.

Improving Existing Neighborhoods

City neighborhood plans have not been updated for several decades. In the ***Neighborhood Plan Prototype*** program, the Miramonte and Jefferson Park neighborhoods have been selected as pilot projects that will be used as template for updating other area plans. This process included several charrettes in both neighborhoods to develop "new and improved" neighborhood plans. For example neighbors strongly emphasized the need to make their neighborhoods more walkable by incorporating sidewalks or decomposed granite paths, safer pedestrian crossings, and shade.

Staff from the Departments of Urban Planning and Design and Transportation have designed a project that will strengthen the pedestrian nature of Grande Avenue. This avenue is the heart of the Barrio Hollywood neighborhood, the location of a number of very popular local restaurants, and a navigational training area for students from the Arizona School for the Deaf and Blind, which lies at the northern end of the project.

The Avenida del Convento/Clearwater Road currently under construction will serve new development on the westside. The project includes landfill remediation and new streetlighting and landscaping. These investments will also serve to mitigate existing adverse traffic impacts on the Menlo Park neighborhood.

Strengthening the Urban Core

PRO Neighborhoods grants are generally used to support improvements in neighborhoods in areas such as walkability or shade availability, as a way of sustaining and strengthening neighborhoods. One of the sucess stories for the PRO Neighorhoods program was the use of grant funding to allow three neighborhoods to come together to plan and implement improved pedestrian/bicycle facilities along Park Avenue.

The recently adopted ***Río Nuevo Overlay District*** and the Area Infill Incentive District provide tools to support development opportunities in the downtown area as part of the revitalization project. Studies analyzing the downtown area's ability to absorb various land uses will be performed, as will an economic analysis to ascertain the impact of the State's recent approval of a twelve-year extension of State Tax Increment Financing (TIF) funding.

The ***Infill Incentive District*** will modify development regulations and fees through the development agreement process. Such a district would address barriers to downtown infill development such as inadequate infrastructure, lengthy permit processes, obsolete development standards, difficult parcel assembly, and environmental clean-up issues. This is the beginning of a larger effort to ensure that entitlement processes are predictable and efficient, and regulatory codes and standards are unambiguous.

The ***Infill Program*** can have implications for neighborhoods such as the compatibility of new structures with the surrounding historic and natural environments and the type of activities infill brings to the neighborhoods. Working together with reprentatives of both public and private interests, staff is developing tools to address these potential issues.

Proposed zones, such as the Neighborhood Preservation Zone and the Mixed Use Zone, and designations like the Residential Cluster Project, are among the tools being developed to address these concerns.

The goal of the ***Design Strategy Program*** is to create a set of guidelines and development standards that support good design and allow flexibility for creative design. A local community focus group is working with city staff to identify themes of development for major southwest cities that apply to our community. These themes will set the framework for a manual that complements, supplements, and interprets the City's design standards.

The ***Brownfields Program*** encourages infill through the redevelopment of brownfield sites. Brownfields redevelopment spurs economic benefits, revitalizes surrounding areas, and reduces development pressure on undisturbed desert areas. With the City's continued downtown revitalization efforts, brownfields sites are remediated, infill is accomplished, historic roots are revitalized, while providing a healthy sustainable environment.

The ***Vacant and Neglected Structures*** (VANS) program involves the survey of properties with residential structures, an assessment of the structures state of neglect, and contact property owners to advise them of their responsibility to restore or remove the neglected structures. Expansion of this program to commercial properties is planned in 2007.

Urban Nature

Promoting and maintaining "urban nature" involves efforts ranging from providing accessible parks and recreation facilities to preservation of important natural habitats. Protecting urban green space requires maintaining the quality of natural areas and restoring areas that have become degraded over time. The City also provides assistance to community groups, developers, businesses, and other organizations indeveloping projects to preserve or enhance natural areas.

New and Planned Parks

A number of new parks were created in 2005 and 2006 including Miramonte Natural Resource Park, Keeling Desert Resource Park, Vista Del Río Cultural Resource Park, Barrio San Antonio Park, and Río Vista Natural Resources Park.

The ***Keeling Desert Resource Park***, an approximately 1/3-acre neighborhood pocket park east of Glenn Street, highlights additional values of parks by using harvesting to promote water conservation and by showcasing sculptures created by artists selected through the Tucson/Pima Arts Council.

The ***Vista Del Rio Cultural Resource Park*** preserves one of the few remaining undisturbed pieces of a 1,000-year old Rincon-phase Hohokam village. The four-acre site contains a very high concentration of artifacts including 15 pit-houses, 12 pits, 2 thermal features and at least 4 cremations. The Parks & Recreation Department has developed the site to preserve and protect the artifacts, as well as provide opportunities for the citizens of Tucson to learn more about the early inhabitants of this area.

The City has plans for additional park projects in 2007 including Painted Hills Natural Resource Park, Arroyo Chico Linear Park, Atterbury Linear Park, creation of an urban pathway along Julian Wash between Kolb Road and Rita Road, and expansion of the Rio Vista Natural Resources Park.

The ***Sonoran Desert Park*** project includes long-range planning for the restoration of natural desert landscape at the base of "A" Mountain, landfill mitigation, restoration of Santa Cruz River riparian habitat, and park amenities. Completion of this project will complement the Origins Heritage Park and create a unique community asset.

Habitat Preservation and Restoration

On November 7, 2006, the Tucson Mayor and Council adopted an ***Interim Watercourse Preservation Policy*** and Development Standard. The policy and development standard reaffirm the City's commitment to watercourse protection and provide greater clarity and consistency to the implementation of the three City riparian habitat preservation ordinances – the Watercourse Amenities, Safety, and Habitat (WASH), Environmental Resource Zone (ERZ), and Floodplain regulations. In 2007, the City will continue to work towards improved wash protection regulations through the consolidation of the three existing riparian habitat ordinances into a comprehensive Environmentally Sensitive Lands Ordinance.

The U.S. Fish & Wildlife Endangered Species Act empowers jurisdictions to create conservation programs unique to their region that protect species that are threatened by human activities. The City's Draft ***Habitat Conservation Plan*** (HCP) will address future water supply projects that may be developed on City-owned lands in Avra Valley and future urban development in the largely undeveloped Southlands, which lies south of I-10. This process involves extensive coordination with county, state and regional government agencies and has been supported by an a technical advisory committee, which provides scientific guidance and recommendations, and a stakeholder advisory committee, which provides direction on implementation and funding options. Ultimately, implementation of an approved HCP would allow appropriate development to proceed in the study areas without jeopardizing sensitive plant and animal species.

The City of Tucson is a partner in two federally sponsored river restoration projects along the Santa Cruz River. The two projects, ***El Rio Medio*** and ***Tres Rios del Norte***, aim to restore riparian habitat along an almost 23-mile stretch of the river. El Rio Medio, which includes that portion of the river between Congress and Prince roads, is particularly important for the City in that it will address habitat restoration, flood control, and recreation needs through downtown Tucson. A public outreach event will be held later in 2007 to solicit community feedback and input on potential restoration approaches.

Urban Nature

Maintaining Urban Greenspace

The City is in the process of developing a city-wide ***Urban Landscape Management Plan*** that will provide direction and management practices for the City's 'green urban environment'. The plan will be defined through assessment of current resources within government, review of current City practices, research on the best practices employed by other jurisdictions, and input from focus groups. As part of the Plan, the City is currently assessing the value of street trees as an asset in order to determine future resource needs for the care and maintenance of these trees.

The ***Camino Del Cerro Roadside Beautification and Demonstration Project*** involves re-vegetation to provide a visual screening for the sewage ponds. During re-vegetation, the City will evaluate several aspects of plant establishment done without the installation of an irrigation system. The four elements of this study include: 1) evaluation of a wide range of drought tolerant plants; 2) the use of water harvesting; 3) the use of water trucks for supplemental watering; and 4) the installation of DriWater. The project will be closely monitored and evaluated for two years.

The City is expecting to begin construction of the ***Park Avenue Detention Basins*** in 2007. This project will include a 42-acre urban open space greenbelt park and a federally funded habitat restoration project.

The ***El Paso and Southwestern Greenway*** will create recreational linkages from South Tucson through downtown Tucson and will include infrastructure and landscape improvements and the installation of public furnishings and art as funding permits.

The ***Trees for Tucson*** program provides low-cost trees for residents to use to shade buildings. Shade trees reduce, energy usage in homes, particularly for summer cooling, as well as provide urban habitat for wildlife.

In 2005, the first ***Urban Heat Island*** workshop was held to educate City staff about the issues of urban heat islands and how staff can individually, and as a City government, implement mitigation measures. A second workshop is planned for 2007.

The City has plans to begin the development of a ***Green Infrastructure Plan*** in 2007. Just as communities approach planning of their streets, sewers, electrical, telecommunication systems and other 'grey' infrastructure in a comprehensive and deliberate manner, the concept of 'green' infrastructure planning uses the same principles. City staff, working together with surrounding jurisdictions, will develop a green infrastructure map, plan, and policies to improve availability of green space in under-served areas, provide better access to recreation opportunities, and create linkages where discontinuity between urban habitate exists.

Outreach and Education

City staff offer rainwater harvesting design consultations on request. Water harvesting presentations are available to help the community understand concepts and techniques they can implement at public, commercial and private sites. Technical assistance and education was provided to a wide range of groups during 2006 and 2007 including Blenman Elm Neighborhood, Tucson Medical Center, Tucson Organic Gardeners, and Pima County Natural Resources, and Parks Recreation staff.

Staff are also available to assit with the development of sustainable concept designs for public, commercial and neighborhood sites. During facilitated workshops, staff help participants consider various factors which, depending on site goals, may include solar orientation, solar technology, water harvesting design, use of native vegetation, natural building materials, LEED building guidelines, and many other considerations. Sustainable design is intended to improve site efficiency, productivity, and comfort, while reducing energy and water use. One project that staff assisted with in 2006 is the Linda Avenue community center site in Menlo Park Neighborhood.

Another aspect of the technical support offered by city staff is callaborative discussions with developers and homebuilders regarding design solutions to help reconcile development with habitat protection. Results can enhance habitat conditions and improve quality of life for Tucsonans, while allowing for growth. The City also assists neighborhood groups with issues related to open space and wash protection and restoration. In 2007, the City will pursue Arizona Water Protection Fund grant money to support a community-driven riparian restoration planning effort along the Atterbury Wash.

Buffelgrass is an invasive, non-native plant species that is rapidly expanding into the Sonoran Desert. The spread of buffelgrass is of concern because the plant tends to "crowd-out" existing plant species and once established, serves as a source of fuel for fires. Fire in the Sonoran desert is not natural and will destroy native species, e.g., cactus, and, once destroyed by fire, the native species have a difficult time reestablishing. Buffelgrass, however, is encouraged by fire, which is natural to its native ecology. Eventually, areas that become infested with buffelgrass will become transformed, with buffelgrass becoming the dominant plant. On Feb. 9, 2007, the City of Tucson, along with over 120 community leaders and scientists, participated in a "Buffelgrass Summit" focused on promoting urgent and concerted action to respond to the growing threat posed by buffelgrass. The Summit was a successful event that resulted in renewed focus and energy directed to this challenge.

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Conservation and Sustainable Development

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